America's Most Powerful Wireless Station

Its 40-Year Career Included Piracy, Intrigue, And Naval And Commercial Traffic!

By Alice Brannigan

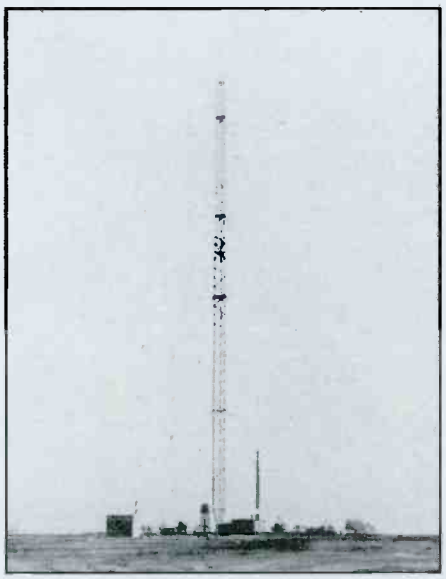
In the early days of wireless telegraphy, the world's major powers realized the strategic values of the medium. Germany began constructing powerful stations in all of its colonies and at certain other sites before 1914, looking toward a worldwide communications system. The powerful Telefunken wireless station at Sayville, New York, (see *Pop'Comm*, August 1996, page 15) was to be a vital wireless link to Germany, but even while that station was still under construction, the Germans began building a second station in Tuckerton, New Jersey. This station was to have an even more powerful alternator-type CW transmitter.

Fancy Financing

To finance the construction of this behemoth, a German company worked out an unusual arrangement with a French corporation, Compagnie Universelle de Telegraphie et de Telephonie sans Fils (CUTT). The agreement stipulated that the French outfit would put up the money — about two million Francs — to build the German-designed station. Then, after the station was finished and proven to be reliable, the French company would assume full ownership. The German company agreed it would then lease this facility from the French company. You may have heard what they often say about the best-laid plans of mice and men. More about that later.

A Spectacular Station

In 1912, the German company, Hochfrequenz-Maschinen Aktiengesellschaft fur Drahtlose Telegraphie (The High Frequency Machine Corporation for Wireless Telegraphy), or HOMAG, purchased a marshy 200-acre site on Hickory Island, near Tuckerton, New Jersey.



HOMAG's wireless station at Tuckerton, New Jersey was the most powerful in the U.S.

HOMAG owned the patent rights in all nations except for Germany and her possessions for the reflection alternator invented by Dr. H.G. Goldschmidt. One such device, which generated 12.5 kW in RF current, had been successfully installed in 1910 by another company in Berlin. HOMAG wanted to build one with a 100 kW power rating in Tuckerton.

Part of HOMAG's agreement with its French associates was that, in addition to the cash the French agreed to spend for construction of the physical plant, they kicked in another 2.5 million Francs. The extra funds were needed because, upon assuming station ownership, CUTT was also to acquire all of HOMAG's lucrative patent rights to the Goldschmidt alternator transmitter.

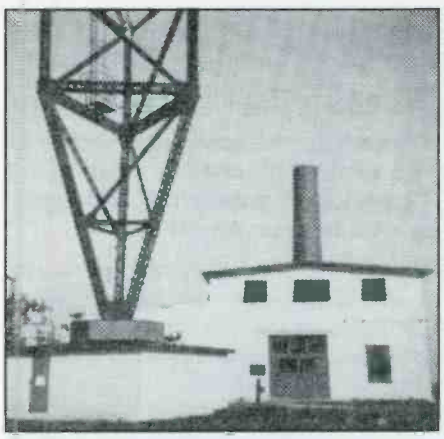
By May of 1912, construction had begun. Towards summer, all of the land had been cleared, the surveying had been completed, and most of the foundation pits were dug. Later in the year, work began on the antenna support tower. As of August, 1913, the triangular steel tower had risen to 520 feet. Later that year, station manager Emil Mayer arrived from Germany with his crew of technicians and the 100 kW alternator, plus whatever else was required to complete the station.

The tower at Tuckerton rose to a height of 865 feet, and supported a massive umbrella-type antenna system.

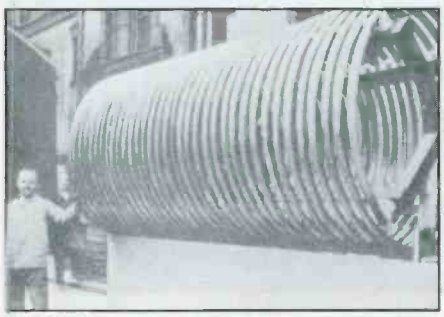
The Antenna

By then, the tower had been completed to its full 825-feet. It rested on a large steel ball that was supported on glass insulators. The tower was used to support the actual antenna.

At the top of the tower, there was a 600-foot wooden mast that extended the structure to 865 feet tall. From the top of the mast, 36 copper cables slanted down 600 feet, umbrella style to huge insulators. From there, steel cables connected the insulators to the tops of 36 poles mounted all around the base of the tower at a distance of 1,500 feet from its base. The natural resonance of the antenna was at 107 kHz. Leads from the antenna wires



Though this is actually a photo of the antenna's base at Telefunken's Sayville station, it's the same construction used to support the 865-foot tower at Tuckerton.



The antenna loading coil (shown before installation). Note the man standing at the left for size comparison. Just imagine how long they had to eat Quaker Oats to finish the contents of a container large enough to wind that monster!

ran down through the steel tower to the transmitter building, located at the tower's base.

Keep in mind that in the early days of wireless, commercial long distance communications normally used frequencies below 100 kHz. Frequencies above 1600 kHz were considered territory best left to experimenters and ham operators.

The Rest Of The Station

All of the buildings were fully constructed by the time the antenna was completed. The station first showed up in 1914 station directories under the call letters WGG, though no frequencies were given.

In 1914, the 100 kW Goldschmidt rig was one of the most powerful CW generators. One terminal of the alternator went to ground, the other directly to the antenna through a loading coil the size of a small bus. This lowered the resonant frequency of the antenna to that of the alternator, which was the station's operating frequency, 40 kHz. Communication was achieved by keying the DC exciting current to the alternator.

Goldschmidt's induction-type alternator was just a big wound-rotor induction motor. Its rotor was three feet in diameter and weighed five tons. The rotor and stator each had 300 poles. It operated at 4,000 r.p.m. from a special 250 h.p. 200 volt DC motor.

The power plant was located in the transmitter building. There were two boilers supplying steam to drive a 400 h.p. engine powering two 120 kW 220 V DC generators. Other steam-driven generators were required to power the station's auxiliary systems.

This station, of course, needed a receiver. Its detector was a new type adapted to the reception of undamped waves. The station manager claimed that he was able to use the receiver to regularly copy POZ in Germany, day and night. This was a 4,000-mile hop.

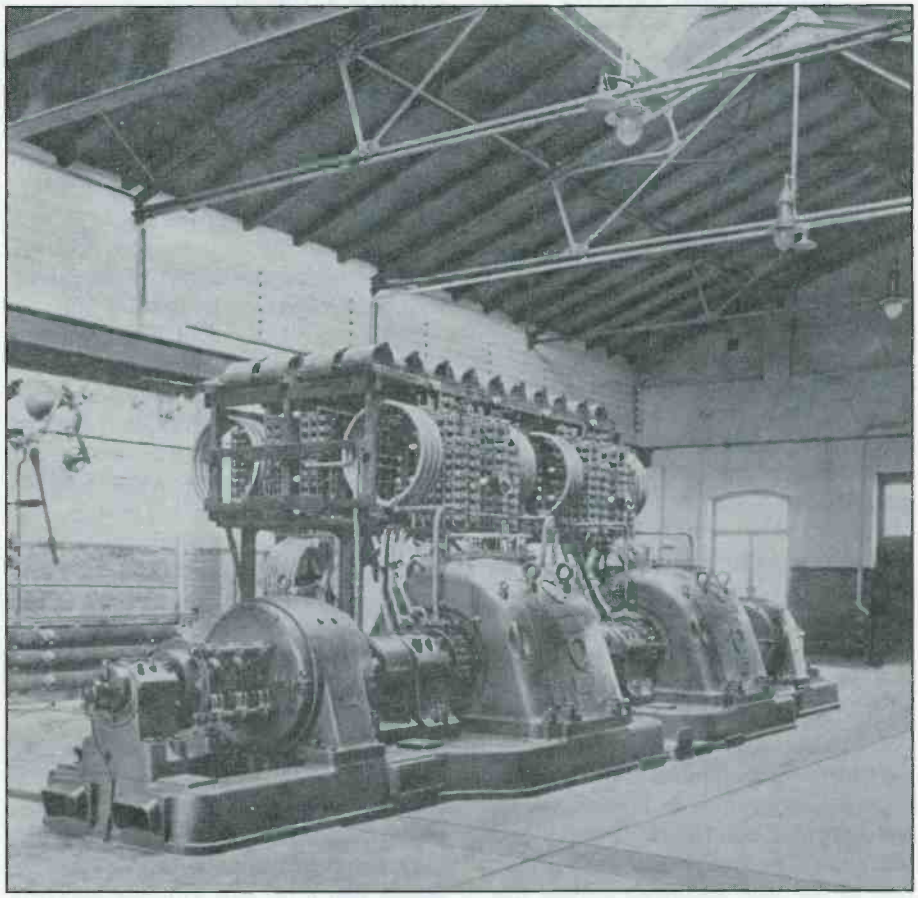
The Tuckerton station was equipped with a new magnetic recording device made in the U.S. by the American Telegraphone Company. This was the ancestor of a modern tape recorder.

A Question Of Motive

HOMAG needed to prove to its French bankrollers that the station really worked before ownership was officially transferred. That meant it had to be able to send a total of 3,000 words of traffic with station POZ in Germany, within a single 24-hour period.

The station began informal transmitter testing with POZ in May, 1914. But just before the formal acceptance transmissions were made for turning it over to the French company that had paid for it, a curious thing happened. In Europe, the assassination of Austrian Archduke Franz Ferdinand by a Serbian on June 28, 1914, was the pretext for war. A system of alliances made the conflict Europe-wide. Germany immediately went to war with France. The German company said it would therefore retain ownership of the Tuckerton station!

This put the U.S. in a peculiar position, in as much as we had not yet entered the



Two Goldschmidt 100 kW alternator transmitters. The Tuckerton station ran 100 kW with an alternator of this design built by HOMAG.

war. In order to maintain our nation's position of neutrality, in August of 1914, our government notified the Tuckerton station that its temporary call letters for experimental use were cancelled, and since it no longer had a license, it could not transmit. In fact, the government said it also decided that neither HOMAG, nor its French associates, would be entitled to hold a license because the companies weren't owned by U.S. citizens, as required by U.S. regulations.

The Tuckerton station was the only station in the U.S. able to contact Germany directly during warm weather when there was a lot of static. Other U.S. stations could accomplish this only via intermediate relay stations. This gave the station an enormous strategic and espionage potential. This, and the circumstances surrounding the timing of events, gave rise to suspicion regarding the motives for its construction and intended purpose. Indeed, it was revealed that Telefunken secretly company-owned HOMAG. Moreover, the German government had surreptitiously pushed the construction of both the Tuckerton and Sayville stations.

Things Get Gnarly

A month after Tuckerton had been formally ordered off the air by the government, the U.S. Navy discovered that the unlicensed station was brazenly operating day and night in full commercial service to Germany, complete with its cancelled former call letters, WGG. The nation's most powerful wireless station was an outlaw! To avoid further threat to U.S. neutrality, on September 10, the Navy was ordered to take over control of the station's commercial transmitting and receiving operations. The Navy assigned Tuckerton the Naval call letters NWW. Existing German staff members were permitted to remain at the plant only to maintain and service the facility, though they were not allowed to operate its transmitting or receiving equipment.

Not So Fast!

The French company, CUTT, was most unhappy about HOMAG's refusal to turn over ownership of the station. They went to court to try to gain its possession. The court decided that HOMAG would continue as the *de facto* owner for the duration of the war. HOMAG agreed that, under those terms, each month it would reimburse the U.S. Navy for all expenses incurred operating the Tuckerton facility. The Navy said that at the end of the war it would turn over to HOMAG all of its income from handling commercial traffic, less the operating expenses.

As luck would have it, the day after the Navy moved in, the stator winding of the alternator failed and the station went dark. A month later, the Navy had moved in its own arc transmitter while repairs were being made, but it ran a mere 30 kW and reached Germany only at night. Then the Navy brought in a 60 kW rig. But by January, that transmitter was also having service problems.

The Navy told HOMAG that the 60 kW arc transmitter was needed at another military facility. That required HOMAG to go to the Federal Telegraph Company and purchase a replacement transmitter for $15,000, plus a royalty of three cents per word transmitted. That transmitter went online in October 1916.

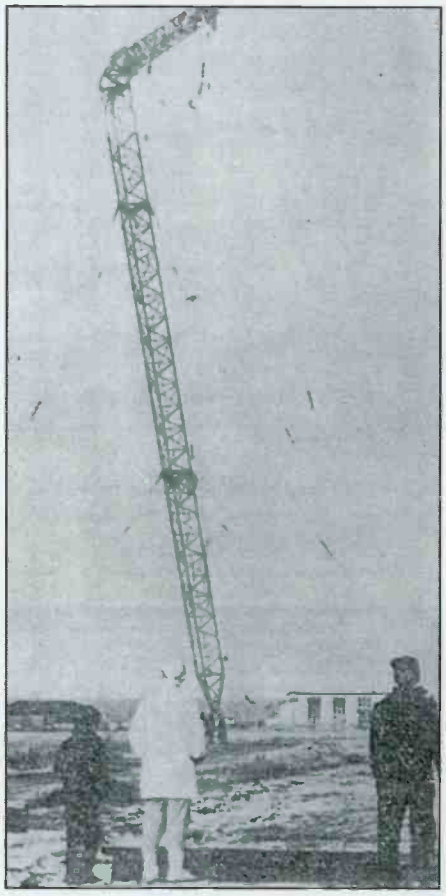
Also in 1916, the receiving point for this station was relocated to a newly built facility in Deering, Maine (a suburb of Portland). This was done to avoid interference from numerous wireless stations in the New York City area. The Navy also ran the receiving site.

War On The Horizon

The war in Europe progressed, and public reaction to it in the U.S. increased to such an extent that on February 8, 1917, all German personnel were told to discontinue their maintenance activities and leave the Tuckerton station. All operations were then taken over by the U.S. Navy.

Upon the U.S. declaring war on Germany (April 6, 1917), the former Tuckerton German staff members were arrested and sent to a POW camp in Virginia. The Tuckerton station's ownership was transferred to the Alien Property Custodian for the duration of the war. The Navy then handled only official government traffic through the station, though it had to install a new 100 kW arc transmitter due to continuing failures of the existing station unit. The U.S. Navy's official operations at the Tuckerton station were on 32.6 kHz.

WSL, the German station at Sayville, was seized by the Navy in February, 1917 after it was discovered that its Telegraphone magnetic recorder had been in use to exchange traffic with POZ at such high speeds that it became virtually encrypted. Mixing in with its routine traffic, there had been German espionage messages,



In December of 1955, the legendary Tuckerton tower was razed. Described as the world's eighth highest structure, the 800-ton steel behemoth broke in two, and in six seconds, toppled. It was cut up and sold for scrap.

including the one that helped U-boats torpedo the British passenger liner *Lusitania*, on May 1, 1915. One can speculate on why such a unit had also been installed at Tuckerton.

When the war ended, courts decided that the Tuckerton station rightfully belonged to CUTT, the French company. CUTT then formed an U.S. subsidiary known as the American Radio Company (ARC), in order to obtain a U.S. radio license. In February, 1917, the Navy signed a lease with ARC, allowing the Navy to continue operating the station until April, 1920, paying ARC $5,500 per month. These rentals, plus profits due under HOMAG ownership, amounted to more than a half-million dollars.

New Owners

But what ARC proved was history by the time the Navy's lease ended. By the end of February, 1920, ARC must have figured they'd quit while they were ahead. That's when they sold the

Tuckerton facility to RCA, reportedly for a million dollars. RCA was happy to have the station because of the tall antenna and high performance 100 kW arc transmitter. Still, they soon upgraded the station by increasing its power to 200 kW with a new Alexanderson alternator, and even obtaining a second Alexanderson 200 kW arc transmitter for standby use.

RCA found that the Alexanderson units were so reliable that they added a second large flattop multiple-tuned antenna, and put the standby transmitter into full-time use. This doubled the traffic-handling capability of the station. The earlier German alternator had been put in storage for possible future use, but several years later was deemed so trouble-prone and obsolete, it was junked.

Under RCA ownership, the transmitter using the old umbrella antenna was reassigned the station's original WGG call letters, and operated on 18.4 kHz. The other transmitter was licensed as WCI and assigned to 18.2 kHz. The receiving facility for both stations was in Belmar, New Jersey. This transmitting facility handled a sizeable portion of RCA's traffic to Europe until 1940. By 1940, however, improved shortwave technology caused the old Tuckerton facility to be placed in standby status.

War Arrives — Again

When the U.S. entered World War II in early December, 1941, the Tuckerton transmitters were again used by the U.S. Navy for sending orders to the fleet. VLF transmission was the only effective medium for penetrating the oceans to reach submarines. Furthermore, it was found to be the most reliable mode for transmission through the auroral zone to our vital base at Thule, Greenland. The Tuckerton plant continued in this service until 1948, when it was again put on standby.

FCC records of 1945 indicate that this facility was licensed as WGG (200 kW) and WGG2 (250 kW) on 22.1 kHz, also WCI (250 kW) and WCI2 (200 kW) on 18.4 kHz.

Some of the old tower's steel guy anchors imbedded in concrete footings are still found near the houses built on the site 43 years ago. The original transmitter building is there, too.

In April, 1953, the former WGG alternator was operated by RCA for the last time with the call letters WEV60 on 18.4 kHz. The former WCI alternator was fired up for 25 minutes in June with the call letters WEV80 on 18.2 kHz. In 1955, these transmitters were scrapped and the tower was razed.

In 1924, RCA had moved their marine telegraph station WSC (as of 1945, on 125 and 143 kHz, plus shortwave) from Siasconset, Massachusetts, to Tuckerton. Before the longwave antenna was scrapped in 1955, WSC was moved again, this time a few miles north to West Creek, New Jersey, though still listed as Tuckerton. WSC was finally closed by RCA on May 8, 1978.

HOMAG's original 200-acre real estate purchase was sold in 1956 to become a housing development called *Mystic Islands*. The 1913 transmitter building and several of the steel guy anchoring rings affixed to concrete footings are found near the houses. Those are the only physical remains of what was the most powerful wireless station in the U.S. nearly 90 years ago.

We welcome old time radio and wireless photos, picture postcards, QSL cards and letters (good copies are OK), news clippings, and station directories, as well as comments and ideas. Our postal address is Alice Brannigan, Popular Communications, 25 Newbridge Road, Hicksville, NY 11801. Or you might wish to send an E-mail directly to me at <Radioville@juno.com>. Be with us next month! ■

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